Urban Design Study
Active Travel to School

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“Active commuting to school can contribute to children achieving recommended physical activity levels. A number of studies have found that children who walk to school are likely to engage in more physical activity overall and are more likely to meet physical activity guidelines than children who travel by motorised travel.”19
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The challenge

In recent decades, there has been a profound change in the methods of travel to school throughout Australia. Four decades ago, 3 out of 4 children walked or cycled to school, compared to only 1 out of 4 children today.\(^1\) Physical inactivity in children and youth is an international epidemic, with the potential of contributing to chronic disease in adulthood.\(^2\) Today, 1 in 5 primary school children, and 1 in 4 secondary school adolescents are overweight or obese.\(^3\)

How can we make it safer and easier for more kids to walk, cycle, and scoot to school?
The aim

The Heart Foundation is working to make it easier for children to walk, cycle, and scoot safely to school. This would create great health benefits, as only 19% of New South Wales children are reaching the recommended 60 minutes of physical activity per day.³ Active travel improvements can also have significant positive impacts across the whole community.

To help increase the number of children who walk or cycle to school, The Heart Foundation is seeking a commitment of government funding for a complementary set of active travel initiatives including the promotion of active travel in schools, dedicated active travel officers within Councils, and active travel infrastructure improvements in the neighbourhoods around primary and secondary schools throughout the state.

This study focuses on active travel infrastructure improvements surrounding three schools in NSW. It explores opportunities for cost-effective upgrades in active travel networks within the walking catchment of a school, based upon its local urban context. These improvements in safety and amenity can encourage more children to independently make their own way to school.

Active travel to school principles

Physical activity
Children’s health can be increased by encouraging physically active journeys to and from school every day.

Safety
The safety of pedestrians and cyclists (particularly of children making their way to school) can be increased by improving the safety of key links in local active travel networks.

Less congestion
Road congestion can be reduced by encouraging more children to independently travel to school, which would reduce the number of car trips for school journeys.
The importance of active travel to school

Education, promotion and physical improvements can increase participation in active travel by between 5 to 20 percent.\textsuperscript{4,5,6}

Why is it important?
Increasing participation in active travel to school in NSW is now more important than ever. In 2015 1 in 5 primary school children, and 1 in 4 secondary school adolescents were overweight or obese,\textsuperscript{3} a situation which has been described as an inactivity epidemic.\textsuperscript{2}

Encouraging children to engage in physical activity has the potential for profound positive impacts for their intellectual development, physical and mental health, social development and confidence, and also for the likelihood that they continue to adopt other healthy behaviours.\textsuperscript{7,8}

There is overwhelming evidence that physical activity helps to prevent disease throughout a person’s life, and that participation in physical activity is difficult as people grow older if physical activities are not instilled at an early age. Therefore, supporting healthy attitudes and instilling active behaviours during childhood and adolescence is important to promoting physical activity.\textsuperscript{2,9,10}

Australia, like many other high-income developed nations, must increase rates of physical activity to combat accelerating rates of chronic disease.\textsuperscript{1}

Active travel today
There has been an ongoing decline in active travel to school over the past few decades.\textsuperscript{1}

Active travel is now the least common way for children to get to school, while being driven is the most common. In 2015, 15% of NSW children used active travel to get to school, while 43% of children were driven by car. This car travel statistic has increased significantly from the 36% of children who were driven to school in 2010.\textsuperscript{3}

Active transport is now rated as a D+ in the 2018 Report Card on Physical Activity for Children and Young People.\textsuperscript{11}

What are the benefits?
Global evidence and international policy affirms the importance and benefits of physical activity. Extensive research illustrates that active travel to and from school facilitates positive health outcomes including improved cardiovascular health, increased concentration, reduced stress, and reduced greenhouse gas emissions.\textsuperscript{12} Active travel to school is also associated with active travel to other destinations, increased safety (both perceived and actual), and reduced congestion.\textsuperscript{13}

Longitudinal studies of Active Travel to School programs in the USA, Northern Ireland and Australia have shown that education, promotion and physical improvements can increase participation in active travel by between 5 to 20 percent, and reduce car transport by 10 percent.\textsuperscript{4,5,6}

Research has demonstrated that physical improvements in the built environment can reduce environmental constraints and increase student active transport self-efficacy.\textsuperscript{4}
The components of active travel

Successful active travel to school programs involve a suite of initiatives working in combination. These include physical active travel infrastructure improvements, school promotion activities, staff training, and government support (policy and funding). The objective of this report is to explore opportunities for physical improvements in a school’s walking catchment that make active travel safer, easier, and more attractive.
Designing for active travel

Safety is a key determinant in children’s ability to walk to school, and a primary safety issue in many situations is when pedestrians need to cross paths with cars.

Creating (or upgrading) crossing points gives pedestrians more visibility, awareness, time, and space to safely navigate these crossings.

Active travel

Good quality footpaths, cycle paths, and crossings welcome people to walk and cycle. Active travel can also be supported by environmental qualities (for example with street trees for shade and visual amenity), and passive surveillance from other people in the street and from properties nearby.

However, not all urban areas have good quality footpaths, bicycle paths, and crossings. Improving active travel links makes walking and cycling safer and more enjoyable. Compared to other forms of public transport and road infrastructure, active transport improvements are relatively low cost, and can have great benefits including healthy physical activity, increased sustainability, and reduced traffic congestion.

Walking catchments

This study focuses on the 2km walking catchment of a school. This approximate half hour journey each way represents a child’s recommended minimum daily physical activity. This catchment also recognises that Transport for NSW provides school travel passes for primary school students who live outside a 2.3km walking distance from school, and secondary students who live outside a 2.9km walking distance from school.

Route selection

Priority routes are the key links between schools and surrounding residential areas. These routes should be direct, follow existing or proposed safe pathways, avoid heavy traffic and noise, cover school walking catchment areas effectively, connect with other modes of transport where possible, and be aligned to serve multiple schools where this is practical.

Improvements

Active travel improvements should create continuity in priority routes to school by providing safe and direct pathways and crossings in key locations. These improvements should consider contextual constraints including pedestrian and vehicle traffic, space, visibility, lighting, and drainage.

Benefits

Pedestrian infrastructure improvements can overcome the major barrier to greater participation in active travel to school by:

- Enhancing pedestrian safety
- Enhancing pedestrian amenity
- Reducing average vehicle speeds
- Addressing key links in the active travel to school network.

Design-led approaches can create new high quality spaces for people, for example by extending kerbs at street corners where parking isn’t allowed, or by adding landscaping to pedestrian crossing upgrades. In these ways, active travel improvements can help create higher quality urban environments for everyone to enjoy.
Types of physical improvements

Crossings

**Kerb extension**
Extending the kerb shortens the crossing without giving pedestrians right of way, and is best used on quiet local streets.

**Pedestrian crossing**
Pedestrian crossings give pedestrians priority, and are most useful in urban centres with higher pedestrian activity.

**Signalised pedestrian crossing**
Traffic signals are best used on wider, faster, or busier roads to provide pedestrians a safe place to cross.

Intersections

**Corner kerb extension**
Kerb extensions at the corners of local side streets suggest greater continuity of the footpath across the side street, which encourages cars to drive more slowly and makes it easier for pedestrians to cross.

**Roundabout with pedestrian crossings**
Roundabouts can be confusing places for pedestrians, as car traffic tends to move continuously in all directions. Adding crossings enables pedestrians to cross with greater ease and confidence. These designs can be useful in both urban centres as well as along roads with moderate levels of car traffic.

**Signalised intersection**
Signalised intersections are often seen on busy roads, and safe crossings are important in these locations. The timing of signals should provide pedestrians a reasonable level of convenience so that they are not left waiting for extended periods, or given minimal time to complete their crossing.

Cost estimates for these physical improvements are listed in the Appendix.
Facilitating increased active travel to school has the potential to produce significant positive impacts across communities, from increased physical activity and improved health outcomes, reduced traffic congestion during peak hour, neighbourhood satisfaction and perceived safety of seeing more people walking.
Case studies

Three NSW schools have been selected to show how this could work

Inner urban
Newcastle High School

Urban
Gosford Public School

Suburban
Kellyville High School

Places

These three schools have been selected for their different urban contexts, as together they broadly represent the various types of places in which people live across Australian cities and towns.

Ranging from dense inner urban places to sprawling suburban areas, these urban contexts present varying opportunities and challenges for active travel to school based on their respective street networks and environmental qualities.

Schools

The selected schools include one primary and two secondary schools. While it is important to consider a range of ages, from a walkability point of view, the urban environment should facilitate safe and comfortable active travel for younger and older children alike.

The walking and cycling priority routes proposed for these three schools make consideration for the locations of other schools located nearby, as well as for other attractive places for children such as playing fields and recreation facilities.

Strategies

Strategies to encourage active travel to school can be adapted to suit the particular urban environments in each place.

The strategies proposed for these three schools can indicate how the active travel to school program could be expanded in scale to attract children across the state to make their own way to school.
Inner Urban

Inner urban areas can provide relatively direct and green routes to school, but may need improvements to pedestrian safety in key locations.

Case study school
Newcastle High School’s enrolment catchment covers the central core of Newcastle. School children also have the opportunity to visit parks, beaches, rail and light rail (under construction) transport, and the city centre.

Inner urban context
Newcastle’s inner urban context features a strong street grid network. This grid offers many potential routes for walking and cycling.

Some local streets are closed to car traffic at one end, making these streets more safe and enjoyable for active travel. Other streets have become thoroughfares for vehicles, and pedestrians will often rely upon crossings to navigate these areas safely.

Street environments
Houses are frequently spaced along most streets, and generally have porches and front rooms facing the street. This provides a reasonable level of passive surveillance of the street, making walking and cycling feel safer due to the apparent proximity of nearby residents.

Some streets in this network feature wide medians for street trees and drainage channels. These mature trees provide shade and amenity, making walking more comfortable.

Challenges
Walking and cycling accessibility throughout this grid network is highly dependent on the quality of crossings available at street intersections. While there are a number of well-located pedestrian crossings, generally the broad street intersections can leave pedestrians and cyclists exposed to car traffic.

Opportunities

1. National Park / King Streets
   Potential to reprogram existing signals
   c. $2,000

2. National Park / Hunter Streets
   Potential to reprogram existing signals
   c. $2,000

3. Dawson / Bull Street
   Corner kerb extension
   c. $15,000

4. Parkway Avenue / Union Street
   Potential to reprogram existing signals
   c. $2,000

5. Turnbull Street / Pacific Highway
   Signalised pedestrian crossing
   c. $300,000
   (See visualisation on next page)

6. Darling Street / Gordon Avenue
   Corner kerb extension
   c. $15,000

7. Darling / Beaumont Streets
   Corner kerb extension
   c. $15,000

8. Parkway Avenue / Pacific Hwy
   Potential to reprogram existing signals
   c. $2,000

9. Parkway Avenue / Dumaresq St
   Corner kerb extension
   c. $15,000

10. Dumaresq / Beaumont Streets
    Add pedestrian crossings to existing roundabout
    c. $100,000
Ten key active travel links to Newcastle High School can be improved for the relatively low cost of approximately $470,000.
Inner Urban

Turnbull Street at the Pacific Highway

Turnbull Street could be a convenient and attractive route to school, and is also proposed as a bicycle route in the Cycle Safe Newcastle network.

The Pacific Highway is four lanes wide and reasonably busy with fast-moving car traffic. There are no existing provisions to facilitate crossing of this road.

A crossing in this location would make this proposed priority route to school more viable, and may have minimal impact upon traffic movements.
A signalised pedestrian crossing in this location can provide a safe and reliable means to cross this road.

This crossing could be very similar to the existing signalised pedestrian crossing at the Pacific Highway and Jenner Parade, located 300m to the north.

Alongside the new signals, kerb ramps can be installed to increase accessibility. A landscaped median with left-in-left-out vehicle access to Turnbull Street would simplify this intersection, and would also reduce through traffic on Turnbull Street, which in turn would increase safety and amenity for pedestrians and cyclists using this street to get to school.
Urban centres can be busy places, and may require safe pedestrian connections to facilitate walkability.

Case study school
Gosford Public School has an enrolment catchment spanning Gosford’s urban centre, however the majority of residential areas within this catchment are located to the east of the school. Other local attractions for children include playing fields, waterfront parks, and the city centre.

Urban context
Gosford has a grid street network that is broken in places by large hills, the railway line, Narara Creek, and occasionally by large blocks such as Gosford Hospital. These breaks in the street network reduce the area that can be accessed within 2km walking distance from school, relative to other more connected places.

Street environments
Local streets in the area can be good places for walking and cycling alongside shopfronts or houses, however some residential streets are missing footpaths, and this can reduce pedestrian safety.

Busy roads and employment areas can be less attractive due to noise and lack of streetfront activity.

Challenges
Walking and cycling in this area is largely dependent on the quality of connections in key locations, such as the limited number of bridges across the railway line. Often these key locations are busy with vehicle traffic, making safe pedestrian footpaths and crossings more important.

Opportunities
1. Racecourse Road / Batley St N
   Pedestrian crossing
   c. $25,000

2. Racecourse Road / Holden St
   Corner kerb extension
   c. $15,000
   (See visualisation next page)

3. Racecourse / Showground Rds
   Signalised intersection
   c. $500,000

4. Racecourse Road / Mann Street
   Potential to reprogram existing signals
   c. $2,000
Four important active travel enhancements can facilitate access from Gosford’s residential areas to a group of local schools for approximately $550,000.
Racecourse Road at Holden Street

Racecourse Road is proposed as a priority walking route from the residential areas of North Gosford to Gosford Primary School (and also Henry Kendall High School). However, it can also be a busy area for cars, especially around Gosford Hospital.

At Holden Street, there is currently a wide street for people to cross, only one kerb ramp, and no physical protection for pedestrians. A crossing improvement in this location can enhance safety and amenity for local school children without impacting upon traffic.
Kerb extensions reduce the distance across the street, making it easier and safer for pedestrians to cross. The narrower street width encourages drivers to move more slowly.

Adding plantings at the street corner enhances the walking experience and helps make a higher quality place.

The inclusion of threshold paving of the surface of the street at the crossing point serves an additional cue to drivers to the potential presence of pedestrians, but does not alter the right-of-way.

These improvements would facilitate safe active travel to schools along this street.
Suburban areas have many attractive residential streets, but active travel opportunities can be limited by distance and the quality of connections across busy roads.

Case study school
Kellyville High School’s enrolment catchment covers extensive suburban areas punctuated by playing fields, major creek lines, and a suburban shopping mall development.

Suburban context
The street network in Kellyville is comprised of relatively straight and direct main roads, circuitous collector roads, and a large number of small culs-de-sac. This network tends to facilitate car travel convenience while active travel routes can be relatively long and indirect.

There are some through-block shortcuts for walking and cycling, however these connections can involve walking between tall fences out of sight from the street, so these links may not always feel safe and inviting, particularly for children.

Street environments
There are houses along each street in Kellyville, but a limited number of trees. So while the street may feel like a safe place for walking and cycling, it may be uncomfortably hot in summer.

Some local streets in the area are missing footpaths, and pedestrians can be forced to choose between walking on vegetated verges on the road.

Main roads in the area are often busy, noisy, and wide. These environments are generally not pleasant places for walking. Signalised pedestrian crossings can provide a safe way across main roads, however large roundabouts can be very difficult for pedestrians to cross due to the relatively continuous flows of traffic in all directions.

Challenges
Active travel to school in this area is highly dependent on priority routes that follow quieter but relatively direct local streets.

Opportunities
1. Windsor Road / Memorial Ave
   Potential to reprogram existing signals
   c. $2,000
2. President / Greenwood Roads
   Corner kerb extension
   c. $15,000
3. President Road / Malonga Ave
   Corner kerb extension
   c. $15,000
4. President Road / Trinity Ave
   Corner kerb extension
   c. $15,000
5. Greenwood Road / Tremain Ave
   Corner kerb extension
   c. $15,000
6. Malonga / Meredith Avenues
   Corner kerb extension
   c. $15,000
7. York Road / Meredith Avenue
   Corner kerb extension
   c. $15,000
8. York Road / Queensbury and Trinity Avenues
   Add pedestrian crossings to existing roundabout
   c. $100,000
   (See visualisation on next page)
9. Green Road / Marella Ave / Cattai Creek Drive
   Add pedestrian crossing near existing roundabout
   c. $100,000
10. Green Road near Broughton Cl
    Potential to reprogram existing signals
    c. $2,000
Active travel to Kellyville High School can be encouraged by ten key improvements for the relatively low cost of approximately $300,000.
Suburban

York Road at Queensbury and Trinity Avenues

The proposed priority routes to Kellyville High School converge on this intersection outside the school.

There is currently a roundabout at this intersection, and three of the four streets have kerb ramps and pedestrian islands (one street is lacking crossing provisions completely). This place can be busy with both cars and buses circulating in and out of the high school.

Four pedestrian crossings at this intersection would improve the safety of children who walk and cycle to school.
Adding pedestrian crossings to this roundabout can give children who walk and cycle to school confidence that they can navigate this crossing safely.

Pedestrian crossings in this location can also reinforce the potential presence of pedestrians in the minds of drivers, many of whom may be driving to school to drop off or pick up children. Improving the quality of the walking environment in this key location can help attract more children to independently walk and cycle to school.
Findings

Challenges
It's not always safe and easy for kids to walk, cycle, and scoot to school in existing Australian urban environments.

Improvements
Relatively low-cost design improvements can be effectively targeted to address key barriers to safe active travel.

Benefits
Safer and more enjoyable routes will encourage parents to allow their children to independently make their own way to school.
Messages

Physical activity
Active travel is a great opportunity for children to add to the recommended 60 minutes of moderate to vigorous physical activity per day.\(^7\)

Safety
Children can experience significant active travel safety improvements as a result of a relatively low-cost investment of around $450,000 per school.

Less congestion
Active travel improvements will encourage more children to walk, cycle, and scoot to school, and will reduce the number of car trips to and from schools.
Appendix

Cost estimates for physical improvements

These cost estimates have been generated using a range of publicly available documents. Actual costs will vary due to a range of site specific conditions and other factors.

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<tr>
<td>Landscaped kerb extension</td>
<td>$10,000 - 20,000(^{21,22})</td>
</tr>
<tr>
<td>Landscaped pedestrian crossing</td>
<td>$10,000 - $40,000(^{21,22,23})</td>
</tr>
<tr>
<td>Signalised pedestrian crossing</td>
<td>$200,000 - $400,000(^{20})</td>
</tr>
<tr>
<td>Landscaped corner kerb extension</td>
<td>$10,000 - 20,000(^{21,22})</td>
</tr>
<tr>
<td>Roundabout with pedestrian crossings</td>
<td>$100,000 to add crossings to an existing roundabout(^{25})</td>
</tr>
<tr>
<td></td>
<td>$200,000 - $300,000 for a new roundabout and crossings(^{20})</td>
</tr>
<tr>
<td>Signalised intersection</td>
<td>$2,000 to reprogram signals with more pedestrian-friendly timing(^{23})</td>
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<tr>
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<td>$500,000 to install a new intersection with pedestrian crossings(^{20})</td>
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Glossary

Amenity
The pleasantness, attractiveness, or physical beauty of a place.

Attractive places
A place that encourages people to congregate due to the quality of the urban environment and the activity within it. Attractive places for children and adolescents include (but are not limited to) schools, community facilities, parks, skate parks, and beaches.

Kerb extension/kerb blister
A kerb extension is the widening of a footpath into space that was previously allocated to the road. The outcome is to narrow the width of the road to reduce vehicle speed, assist pedestrian crossing, discourage through traffic, minimise inconvenience for local residents, and provide a landscaping opportunity.

Median
A space between car lanes in the centreline of a road. Medians can provide multiple benefits including; providing pedestrians with a refuge, separating vehicles and reducing the risk of collision, preventing overtaking, reducing vehicle speed, and as a landscaping opportunity. A median island with a break can form a pedestrian refuge island to protect pedestrians midway through a crossing of a street.

Passive surveillance
The sense of visibility in streets and public spaces that enables real and/or perceived safety, and deters crime. Passive surveillance can be achieved by ensuring windows, entrances, and frontages of buildings face streets and public spaces, as well as by the effective use of lighting at night.

Street network /street grid
The system of interconnecting roads, streets, and pathways in any given area. These systems tend to follow patterns based on original layouts and/or evolving uses for land.

Suburban
An area of low to medium density. Suburban areas tend to be comprised mostly of residential areas interspersed with schools, parks, and shopping centres.

Urban
An area of medium to high density development. Urban areas tend to have a higher population, density, a variety of activities (such as places for living, working, and recreation that are often mixed), a diverse economy, and extensive infrastructure.
References


23. Bitzios Consulting, 2015, Blue Mountains Pedestrian Access and Mobility Plan – Blue Mountains City Council